

CLAIMS

What is Claimed is:

1. A display control system for converting a VGA display signal to a flat panel display  
5 signal, comprising:  
a video memory for storing character codes and associated attribute code data relating  
to a VGA display;  
a character generator connected to said video memory and for generating a character  
font data based on the character code, row number and display resolution, said  
10 character font data selected to fill a flat panel display;  
a character generator memory connected to said character generator for storing  
character font data; and  
an signal attribute controller for providing an output signal for a flat panel display from  
the output of the character generator under the control of said attribute code data.
2. A display control system according to claim 1 wherein said character generator  
memory resides in layer 3 of the VGA video RAM.
3. A display control system according to claim 1 wherein said attribute controller maps  
20 color attribute data to another color space.
4. A display control system for converting a VGA display signal to a flat panel display  
signal, comprising:  
a video memory for storing character codes and associated attribute code data relating  
25 to a VGA display;

a character generator connected to said video memory and for generating a character font data;

a first character memory connected to said character generator for storing character font data;

5 a row number generator for deriving character row number based on horizontal frequency;

a second character memory for storing font data for a plurality of rows; and

an attribute controller for providing an output signal for a flat panel display from the output of said character generator under the control of said attribute code data, said attribute controller operatively coupled to said row number generator, said output signal comprising pixel data sufficient to fill the flat panel display.

10 5. A display control system according to claim 3 wherein said attribute controller maps color attribute data to another color space.

15 6. A display control system according to claim 3 wherein said attribute controller includes a lookup table for each row, each of said lookup tables containing expanded cell line information.

20 7. A display control system according to claim 6 wherein said row lookup tables reside in layer 3 of the VGA video RAM.

8. A display control system according to claim 7 wherein the row lookup table for the next row is loaded into VGA video RAM during horizontal blanking.

9. A method for expansion of a first sequence of data elements representing successive rows of successive character cells corresponding to a sequence of text characters to a second sequence of data elements longer than said first sequence, the method comprising:

- 5 receiving a data element representing a row of a text character cell;  
forming a horizontal expansion pattern corresponding to said text character, said pattern set to a specified length;  
appending said horizontal expansion pattern to the second sequence of data elements;  
and  
10 determining whether another data element should be read.

10. A method according to claim 9 wherein  
said specified length is the same for all horizontal expansion patterns comprising said  
second sequence of data elements; and  
15 said second sequence of data elements fills a flat panel display.

11. A method according to claim 10 wherein said horizontal expansion pattern is  
contained in a lookup table indexed by character number and row number.

20 12. A method according to claim 11 wherein said lookup table resides in layer 3 of VGA video RAM.

13. A method according to claim 9 wherein  
said data element comprises eight bits; and

said horizontal expansion pattern comprises ten bits.

14. A method for expansion of a first sequence of data elements representing successive  
5 rows of successive character cells corresponding to a sequence of text characters to  
a second sequence of data elements longer than said first sequence, the method  
comprising:
- receiving a plurality of bits representing a plurality of text character cell lines;  
determining the character cell row number based on the horizontal frequency;  
10 determining the first and last bits for each data element within said first sequence;  
forming a horizontal expansion pattern corresponding to said text character, said pattern  
set to a specified length;  
appending said horizontal expansion pattern to the second sequence of data elements;  
and  
15 determining whether another data element should be read.
15. A method according to claim 14 wherein determining the first and last bits for each  
data element comprises
- scanning said plurality of bits for repeating bit values at whole number multiples of eight  
20 or nine, said bit values corresponding to the background color;  
setting the cell line bit length to said whole number multiple;  
setting the first bit of a data element to the bit following said repeating bit value; and  
setting the last bit of a data element based on said first bit and said cell line bit length.

16. A method according to claim 15 wherein said horizontal expansion pattern is contained in a lookup table.

17. A method according to claim 16 wherein said lookup table resides in layer 3 of VGA  
5 video RAM.

18. A method according to claim 15 further comprising  
determining whether a horizontal scan has completed;  
loading into VGA RAM a lookup table containing horizontal expansion information for  
10 the next row when a horizontal scan has completed.

19. A method according to claim 18 wherein said lookup table resides in layer 3 of VGA  
video RAM.

20. A computer system comprising:

a central processing unit;

a system memory;

a bus controller coupled to said central processing unit and said system memory;

a video controller coupled to said bus controller, said video controller comprising

20 a video memory for storing character codes and associated attribute code data  
relating to a VGA display;

a character generator connected to said video memory and for generating a  
character font data based on the character code, row number and display  
resolution, said character font data representing an expanded cell line;

a character generator memory connected to said character generator for storing  
character font data; and  
an attribute controller for providing an output signal for a flat panel display from the  
output of the character generator under the control of said attribute code data;  
5 and  
a display panel coupled to said video controller for display of said output signal.

10 21. A program storage device readable by a machine, tangibly embodying a program of  
instructions executable by the machine to expand a first sequence of data elements  
representing successive rows of successive character cells corresponding to a  
sequence of text characters to a second sequence of data elements longer than the  
first sequence, comprising  
a first module comprising code for causing a machine to read a data element representing  
a row of a text character cell;  
15 a second module comprising code for causing a machine to form a horizontal expansion  
pattern corresponding to said text character, said pattern set to a specified length;  
a third module comprising code for causing a machine to append said horizontal  
expansion pattern to the second sequence of data elements; and  
a fourth module comprising code for causing a machine to determine whether another  
20 data element should be read.

22. A program storage device according to claim 21 wherein  
said specified length is the same for all horizontal expansion patterns comprising the  
second sequence of data elements; and  
25 the second sequence of data elements fills a flat panel display.

23. A program storage device according to claim 22 wherein said horizontal expansion pattern is contained in a lookup table indexed by character number and row number.

5 24. A program storage device according to claim 23 wherein said lookup table resides in layer 3 of VGA video RAM.

25. A program storage device according to claim 24 wherein the data element comprises eight bits; and said horizontal expansion pattern comprises ten bits.

10 26. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to expand a first sequence of data elements representing successive rows of successive character cells corresponding to a sequence of text characters to a second sequence of data elements longer than the first sequence, comprising

15 a first module comprising code for causing a machine to receive a plurality of bits representing a plurality of text character cell lines;

20 a second module comprising code for causing a machine to determine the character cell row number based on the horizontal frequency;

a third module comprising code for causing a machine to determine the first and last bits for each data element within the first sequence;

25 a fourth module comprising code for causing a machine to form a horizontal expansion pattern corresponding to said text character, said pattern set to a specified length

and append said horizontal expansion pattern to the second sequence of data elements; and

a fifth module comprising code for causing a machine to determine whether another data element should be read.

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27. A program storage device according to claim 26 wherein determining the first and last bits for each data element comprises

scanning said plurality of bits for repeating bit values at whole number multiples of eight or nine, said bit values corresponding to the background color;

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setting the cell line bit length to said whole number multiple;

setting the first bit of a data element to the bit following said repeating bit value; and

setting the last bit of a data element based on said first bit and said cell line bit length.

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28. A program storage device according to claim 27 wherein said horizontal expansion pattern is contained in a lookup table.

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29. A program storage device according to claim 28 wherein said lookup table resides in layer 3 of VGA video RAM.